

Project Bulletin



Using Dredge Spoil to Stabilize Deteriorating Marshes

Challenge

The stability of coastal salt marshes is highly dependent on the natural accumulation of sediments. As coastal populations have increased in recent years, coastal management practices such as inlet stabilization, post-storm bulldozing and beach front development have interrupted the natural supply of sediments to back barrier marshes, resulting in deterioration of marsh systems. This project examines the feasibility of introducing sediments, specifically dredged material, to stabilize deteriorating marshes. This project will also help establish management guidelines for this new marsh restoration technique.



Deteriorating marsh (Feb - 2001).

Science

Approach

The right amount of sediment can help stabilize a deteriorating marsh, but too much sediment can be lethal to the vegetation. The focus of this project is on determining that critical threshold.

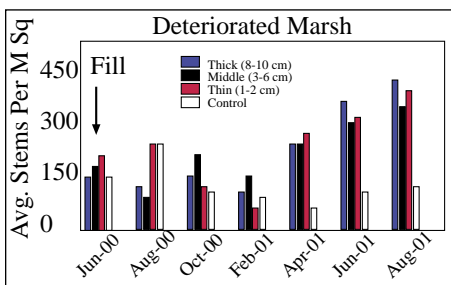
Experimental Design

Researchers established five plots in two different areas of the marsh: one with deteriorating vegetation, the other with healthy vegetation. In each plot, sediment was added at three levels of thickness and a portion of the plot was left unchanged as a control. For all plots, researchers measured changes to the plant, algae and benthic faunal communities.

Results

Preliminary results indicate that:

- adding sediment to the deteriorating marsh sites increased vascular and microalgal biomass
- adding sediment to the healthy sites did not impact the marsh
- the level of sediment addition did not have a significant effect. This result is encouraging for those looking to find beneficial uses for dredged sediment.



Deteriorating marsh, post-treatment (March - 2001; compare with photo in upper right corner).

Application

Broad Scale Test Needed

Permitting issues limited the scale of this project. North Carolina does not have a permitting provision for "research" oriented projects that involve dredging and/or filling, so the project was treated more or less as a commercial endeavor. Also, researchers decided to limit the size of the experimental plots in order to qualify for a less restrictive permit. In the future, researchers hope to collaborate with the U.S. Army Corps of Engineers so that this technique can be tested on a broader scale.

Winter vs. Summer

For this project, sediment additions occurred during spring and summer when plant biomass was high. As a result, plants suffered an initial impact. Though not possible for this project, adding the sediment during winter, when there is little above ground biomass, may renourish the marsh without the initial negative impacts.

Project Essentials

Title: Sediment recycling: marsh renourishment through dredge material disposal

Project Coordinator: Lynn Leonard
Univ. of North Carolina, Wilmington
Center for Marine Science
(910) 962-2338
lynnl@uncw.edu

Start - End Date: 09/01/1999 - 09/01/2001

NERR Reserve(s): North Carolina

CICEET Contact: Kalle Matso (603) 862-3508
kalle.matso@unh.edu